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Civilian Radioactive Waste Management System
Management & Operating Contractor

Geology/Hydrology Environmental Baseline File

B00000000-01717-5700-00027 REV 01, DCN 1

June 1999

Prepared for:

U.S. Department of Energy
Yucca Mountain Site Characterization Office
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Prepared by:

_____ _____

D.F. Fenster — Date
Site Description and Regulatory Documents

Checked by:

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CHANGE HISTORY

Revision	Document Change Notice	Date	Description of Change
00	N/A	September 1997	Initial Issue. Note that Revision 00 did not use a Document Identifier number.
01	N/A	March 1999	Complete revision to update document with more recent results of site characterization, especially as presented in the *Yucca Mountain Site Description*, REV 00 (CRWMS M&O 1998)
01	01	June 1999	Cover page changed to correct quality designation. Pages in reference section changed to correct typographic errors and traceability numbers. Other minor changes were made to address comments resulting from the Yucca Mountain Site Characterizaiton Office acceptance review.

PREFACE

The objective of the *Geology/Hydrology Environmental Baseline File* is to provide information on the Yucca Mountain site in a manner that will be useful for the preparation of the Environmental Impact Statement for the Yucca Mountain Site. As such, the *Geology/Hydrology Environmental Baseline File* is primarily a summary of the *Yucca Mountain Site Description* (CRWMS M&O 1998) and other important references that synthesize the results of site characterization studies or present other important information. This baseline file contains information on the geology, hydrology, natural resources, and rock and soil properties of the Yucca Mountain site. Section 1, Regional and Site Geology, focuses on geomorphology, stratigraphy, and structural geology and tectonics including volcanism and seismic hazards. Section 2, Hydrology, discusses the hydrology of surface water, the unsaturated zone, and the saturated zone. Section 3, Natural Resources, contains discussions of natural resources that occur in the Southern Great Basin such as metallic mineral, industrial rocks and minerals, hydrocarbon and geothermal resources. Section 4, Geoengineering, discusses the stratigraphic framework for rock testing, rock structure properties from field studies, laboratory properties of rock core samples, rock mass properties, in situ stress conditions, excavation characteristics, and engineering properties of surficial deposits.

The Environmental Programs Department of the U.S. Department of Energy's Civilian Radioactive Waste Management System Management and Operations Contractor performed an analysis according to Quality Administrative Procedure 2-0, *Conduct of Activities*, of the request by the U.S. Department of Energy to complete environmental and engineering baseline files. This analysis documented that this activity is not quality affecting and thus is not subject to the *Quality Assurance Requirements and Description* (DOE 1998). This environmental baseline file was prepared and reviewed under Civilian Radioactive Waste Management System Management and Operating Contractor procedure PRO-TS-003, *Development of Technical Documents Not Subject to QARD Requirements.*

In accordance with PRO-TS-003, Jefferson R. McCleary checked the document. On behalf of Robert W. Craig of the U.S. Geological Survey, John S. Stuckless and William W. Dudley, Jr. provided technical reviews. On behalf of Lee Morton, Edward W. McCann provided technical review for the CRWMS M&O Environmental Programs Department. In addition to the Lead Preparer, David F. Fenster, contributions to the document were also made by George H. Davis (Section 2) and Gerald P. Kashatus (Section 3).

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ACRONYM LIST

BP	Before present
CFu	Crater Flat unit
CHn	Calico Hills nonwelded ash flow tuff
DOE	U.S. Department of Energy
ESF	Exploratory Studies Facility
Ga	billion years ago
ka	thousand years ago
ky	thousands of years
kyr	thousand years
Ma	million years ago
M&O	Civilian Radioactive Waste Management System Management and Operating Contractor
MAP	mean annual precipitation
M_d	duration magnitude (a measure of earthquake size)
M_I	intensity derived magnitude (a measure of earthquake size)
M_L	local magnitude (a measure of earthquake size)
M_S	surface-wave magnitude (a measure of earthquake size)
M_w	moment magnitude (a measure of earthquake size)
NRC	U.S. Nuclear Regulatory Commission
PGA	peak ground acceleration
PGV	peak ground velocity
PTn	Paintbrush nonwelded bedded tuffs
Tac	Calico Hills Formation
Tcb	Bullfrog Tuff
Tcp	Prow Pass Tuff
Tct	Tram Tuff
TCw	Tiva Canyon welded tuff
Tma	Ammonia Tanks Tuff
Tmr	Rainier Mesa Tuff
Tpc	Tiva Canyon Tuff
Tpp	Pah Canyon Tuff
Tpt	Topopah Spring Tuff
Tptpll	Topopah Spring Tuff, lower lithophysal zone
Tptpln	Topopah Spring Tuff, lower nonlithophysal zone
Tptpmn	Topopah Spring Tuff, middle nonlithophysal zone
Tptpul	Topopah Spring Tuff, upper lithophysal zone
Tpy	Yucca Mountain Tuff
TSw	Topopah Spring welded devitrified ash flow tuff

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